Appendix A

Biological Assessment/Screening Level Risk Assessment/ Biological Opinion

Introduction

This appendix has been prepared by the U.S. Department of Energy (DOE) to comply with requirements set forth in Section 7 of the Endangered Species Act (ESA) (16 U.S.C. 1531 et seq.) and the National Environmental Policy Act (NEPA) (40 CFR 1502.25). It includes the following documents:

- Biological Assessment, including DOE's determinations (Appendix A1)
- A screening-level risk assessment (Appendix A2)
- The U.S. Fish and Wildlife Service (USF&WS) Biological Opinion (Appendix A3)

This appendix addresses the potential effects of remediation alternatives on listed threatened and endangered species and on critical habitat for the Moab, Utah, Uranium Mill Tailings Radiation Control Act (UMTRCA) site. The alternatives are discussed in detail in the *Remediation of the Moab Uranium Mill Tailings, Grand and San Juan Counties, Utah, Draft Environmental Impact Statement* (DOE/EIS-0355D). The analyses focus on contaminated ground water that is currently affecting the Colorado River. The alternatives evaluated in the environmental impact statement (EIS) address both surface remediation and ground water remediation under the proposed on-site and off-site disposal alternatives. All alternatives except the No Action alternative would include active ground water remediation at the Moab site, because this medium presents the greatest potential to adversely affect threatened and endangered aquatic species. Less emphasis is placed in this appendix on terrestrial species, because preliminary investigations and consultations do not indicate an imminent adverse effect to threatened and endangered terrestrial species for any of the proposed disposal cell locations.

Background

In 1978, Congress passed UMTRCA, 42 U.S.C. §§ 7901 et seq., in response to public concern regarding potential health hazards of long-term exposure to radiation from uranium mill tailings. Title I of UMTRCA requires DOE to establish a remedial action program and authorizes DOE to stabilize, dispose of, and control uranium mill tailings at 24 uranium-ore processing sites and associated vicinity properties (properties where uranium mill tailings were used as construction or fill material before the potential hazards associated with this material were known). In October 2000, the Floyd D. Spence National Defense Authorization Act (Floyd D. Spence Act) for fiscal year (FY) 2001 (Public Law 106–398) added the Moab site to the list of UMTRCA Title I sites and gave DOE responsibility for remediation of the site.

Prior to its transfer to DOE, the site had been owned and operated by the Uranium Reduction Company and later the Atlas Minerals Corporation under a license issued by the U.S. Nuclear Regulatory Commission (NRC). The processing facility no longer operates and has been dismantled except for one building that is currently used by DOE for maintenance and storage space. During its years of operation, the facility accumulated approximately 11.8 million tons of uranium mill tailings. Uranium mill tailings are the naturally radioactive residue from the processing of uranium ore. The tailings at the Moab site contain constituents that have contaminated the nearby soil and ground water at levels that exceed U.S. Environmental Protection Agency (EPA) standards in 40 CFR 192, "Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings."

Decommissioning of the mill began in 1988, and an interim cover was placed on the tailings pile between 1989 and 1995. In 1996, Atlas submitted a reclamation plan and an application to NRC for an amendment to its existing NRC license (No. SUA-917) to allow for reclamation of the site. In May 1994, USF&WS provided comments to NRC on its Notice of Intent to prepare an EIS for site reclamation, stating concerns that included water depletion and contaminant effects on endangered fish. A biological assessment was prepared in 1995 and supplemented in 1997. USF&WS issued a Final Biological Opinion in 1998. The opinion was based on a proposed action of stabilizing the contaminated materials in place, and it concluded that continued leaching of existing concentrations of ammonia (and other constituents) would jeopardize the continued existence of endangered fish species in the Colorado River. In addition, depletion of Colorado River water (associated with remedial actions) would jeopardize four endangered species. The action would also affect critical river habitat for the razorback sucker and Colorado pikeminnow. In its Final Biological Opinion, USF&WS proposed mitigative measures that would be protective of endangered fish species and critical habitat. Because USF&WS considered ground water remediation an "interrelated action," the opinion included a request for an expedited ground water compliance action plan. DOE is addressing ground water remediation within the scope of the EIS.

Stakeholders, including federal and state agencies, have expressed concern that elevated levels of site-related ground water contaminants, primarily ammonia, are reaching the Colorado River. The USF&WS and Utah Division of Wildlife Resources (UDWR), among others, are concerned because the segment of the Colorado River near the Moab site is also designated critical habitat for four endangered fish species. The Columbia Environmental Research Center of the U.S. Geological Survey conducted a study in 1998. The study was updated in 2002 and concluded that ammonia concentrations entering the river from the Moab site may present a risk to endangered fish species (USGS 1999, 2002). The study also concluded that current Utah surface water quality standards for ammonia would be protective of fish species. DOE has identified, through a screening level risk assessment, four other contaminants of concern that could adversely affect aquatic receptors; manganese, copper, sulfate, and uranium. Appendix A2 summarizes the analyses that identified these contaminants of potential concern.

By letter dated February 8, 2001, during transition of ownership of the site to DOE, USF&WS withdrew its Biological Opinion pending additional consultation. Since acquiring the site, DOE has undertaken informal consultation and short-term actions to mitigate impacts to endangered fish. In 2002, 2003, and 2004, DOE consulted with USF&WS to implement initial and interim actions that are anticipated to reduce the influence of contamination on designated critical habitat. These actions are discussed in more detail in the attached Biological Assessment (BA).

Appendix A1

Biological Assessment

BIOLOGICAL ASSESSMENT
REMEDIATION OF THE MOAB URANIUM MILL TAILINGS

U.S. DEPARTMENT OF ENERGY
Grand Junction, Colorado

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LOCATION: Grand and San Juan Counties, Utah

Activities are contemplated in portions of the following townships, depending on the alternative selected in the *Remediation of the Moab Uranium Mill Tailings, Grand and San Juan Counties, Utah, Environmental Impact Statement* (EIS):

T 21 S	R 19, 20 E	T 30 S	R 23, 24 E
T 22 S	R 19, 20 E	T 31 S	R 23, 24 E
T 23 S	R 18, 19, 20 E	T 32 S	R 23, 24 E
T 24 S	R 19, 20 E	T 33 S	R 23, 24 E
T 25 S	R 20, 21 E	T 34 S	R 23, 24 E
T 26 S	R 21, 22 E	T 35 S	R 23, 24 E
T 27 S	R 22, 23 E	T 36 S	R 22, 23 E
T 28 S	R 22, 23 E	T 37 S	R 22 E
T 29 S	R 23 E	T 38 S	R 22 E

U.S. Geological Survey (USGS) Quadrangles: Crescent Junction, Klondike Bluffs, Valley City, Merrimac Butte, Golden Bar Canyon, Moab, Rill Creek, Kane Springs, La Sal Junction, La Sal West, Hatch Rock, Sandstone Draw, Church Rock, Monticello North, Monticello South, Abajo Peak, Blanding North, Blanding South.

A1−1.0 Introduction

This Biological Assessment (BA) documents and assesses the proposed surface and ground water remedial actions for disposition of the uranium mill tailings pile and mill-related contamination on vicinity properties located near Moab, Utah (Figure A1−1). Sufficient information is provided to determine the potential effects on federal threatened or endangered species of the proposed alternatives addressed in the U.S. Department of Energy's (DOE's) EIS. This BA also documents initial and interim actions implemented to date to mitigate ongoing impacts to aquatic species in the Colorado River caused by elevated ground water concentrations of mill-related contaminants (Section A1−4.3).

For some terrestrial species, site-specific investigations may need to be conducted prior to a final determination of effects. This BA is prepared in accordance with requirements in Section 7 of the Endangered Species Act (ESA) (16 U.S.C. 1531) and complies with the requirements established in U.S. Fish and Wildlife Service (USF&WS) regulations (50 CFR 402) and DOE's National Environmental Policy Act (NEPA) regulations (10 CFR 1021).

A1−2.0 Species Evaluated

Three plant, six bird, four fish, and two mammal species that may occur near the Moab site or at alternative proposed disposal sites are federally protected under the ESA. This list of species was based on consultation with the USF&WS (Table A1−1) during April 2003 (USF&WS 2003a, 2003b) and information obtained from the Utah Division of Wildlife Resources (UDWR) and the Bureau of Land Management (BLM), Moab and Monticello Offices.

Table A1−1. Species Considered in the 2004 BA for the Moab Site, Moab, Utah

Common Name	Scientific Name	Federal Status
PLANTS		
Navajo sedge	*Carex specuicola*	T
Jones cycladenia	*Cycladenia humilis* var. *jonesii*	T
Clay phacelia	*Phacelia argillacea*	E
BIRDS		
Bald eagle	*Haliaeetus leucocephalus*	T
Mexican spotted owl	*Strix occidentalis lucida*	T
California condor	*Gymnogyps californianus*	E
Southwestern willow flycatcher	*Empidonax traillii extimus*	E
Yellow-billed cuckoo	*Coccyzus americanus*	C
Gunnison sage grouse	*Centrocercus minimus*	C
FISH		
Humpback chub	*Gila cypha*	E
Bonytail	*Gila elegans*	E
Colorado pikeminnow	*Ptychocheilus lucius*	E
Razorback sucker	*Xyrauchen texanus*	E
MAMMALS		
Black-footed ferret	*Mustela nigripes*	E
White-tailed prairie dog	*Cynomys leucurus*	*

T = federal threatened, E = federal endangered, C = federal candidate, * = Petition Under Review

A1−2.1 Critical Habitat

The USF&WS has designated the floodplain and Colorado River segment adjacent to the Moab site as critical habitat for the humpback chub, bonytail, Colorado pikeminnow, and razorback sucker (50 CFR 17.95). Critical habitat is defined as "…specific areas on which are found those physical or biological features essential to the conservation of the species and which may require special management considerations or protection" (USF&WS 1998b). Activities associated with the disposal site and alternative disposal sites would occur in the vicinity of this designated critical habitat. No critical habitat for terrestrial species exists in the vicinity of the Moab, Klondike Flats, Crescent Junction, or White Mesa Mill disposal site locations. Likewise, no critical terrestrial habitat has been identified within the transportation corridors. The proposed pipeline transportation route to the White Mesa Mill site is within 2 miles of designated critical habitat for Mexican spotted owl and is in the vicinity of a Gunnison sage grouse conservation area (not designated critical habitat).

A1−3.0 Consultation to Date

The U.S. Nuclear Regulatory Commission (NRC) initiated consultation on the remediation of the Moab uranium mill tailings pile during preparation of a previous EIS (NRC 1999). For that EIS, NRC prepared a BA in 1995 that concluded endangered fish species could be exposed to potentially toxic levels of site-related contaminants. The BA also concluded that remediation of the tailings pile could disturb breeding activities for the southwestern willow flycatcher, if this species were present in the vicinity of the millsite.

NRC updated its BA in 1997. In this revision, it was determined that ammonia was at potentially toxic levels where site ground water entered the river and that this constituent could adversely affect endangered fish. The updated BA further evaluated the potential for the southwestern willow flycatcher and peregrine falcon to be adversely affected by selenium and mercury. The results were inconclusive.

USF&WS issued its Final Biological Opinion in July 1998. At that time, it was the Service's opinion that capping the pile in place would jeopardize the continued existence of the razorback sucker and Colorado pikeminnow due to continued leaching of contaminants (primarily ammonia) into the Colorado River, water depletion in the river, and adverse modification of designated critical habitat. This opinion was based primarily on the lack of a ground water corrective action plan. It provided a set of reasonable and prudent measures that would help to minimize these adverse impacts. USF&WS also concluded that the proposed action would not jeopardize the southwestern willow flycatcher and provided prudent measures to minimize take of that species. The peregrine falcon was not addressed in the Biological Opinion.

NRC published its final EIS in 1999. However, responsibility for cleanup of the Moab tailings pile was transferred, by act of Congress, to DOE in October 2000 (Floyd D Spence Act, Public Law 106-398). In February 2001, based on circumstances that pre-dated transfer of the site to DOE, USF&WS rescinded its Final Biological Opinion. Since DOE acquired responsibility for the Moab site, many activities, including characterization, maintenance and operational activities, and interim actions, have taken place. Before implementing these actions, DOE consulted regularly with USF&WS concerning threatened and endangered species that may be affected by these activities. These consultations, and DOE determinations, resulted in concurrences by USF&WS dated March 23, 2001, September 12, 2001, January 22, 2002, and April 5, 2004. In all cases, it was determined that these actions would not jeopardize the continued existence of any aquatic or terrestrial threatened or endangered species.

In support of the preparation of the draft EIS for remediation of the Moab site, DOE sent a request for information to USF&WS in March 2003. USF&WS responded in April 2003 with an updated list of threatened, endangered, proposed, and candidate species that may occur in the potentially affected areas under the various alternatives.

On April 24, 2003, DOE and USF&WS met in Salt Lake City to discuss the BA approach and scope. This meeting also included discussions regarding options for preparing a biological opinion (BO) prior to identifying preferred alternatives for soil and ground water remediation.

A teleconference with USF&WS, DOE, the U.S. Environmental Protection Agency (EPA), and the Utah Department of Environmental Quality took place on July 9, 2003, to discuss the applicable numeric ammonia criteria.

On August 25, 2003, USF&WS and DOE met in Salt Lake City to further discuss applicable risk-based criteria and standards that would be protective of endangered fish. On November 3, 2003, the draft BA was forwarded to USF&WS for comment. DOE received initial comments on the BA in early December 2003. Following receipt of the comments, a meeting was held on December 15, 2003. Additional comments were received in early January 2004, followed by telephone conferences to clarify issues and concerns.

On April 14, 2004, DOE submitted the final draft BA to USF&WS. In June through August 2004, DOE and USF&WS consulted extensively to resolve final comments on this document.

On August 10, 2004, DOE received formal comments on the final draft BA.

On May 26, 2005, based on the identification of off-site disposal at Crescent Junction using mostly rail and active ground water remediation as DOE's preferred alternatives, USF&WS submitted the final BO, which is included as Appendix A3.

A1−4.0 Description of the Proposed Action

DOE is proposing to remediate contaminated soils and materials and contaminated ground water at the Moab site. Three disposal alternatives are presented in the EIS:

- On-site disposal of tailings
- Off-site disposal of tailings (three locations, three transportation options considered)
- No action

On-site disposal of tailings is discussed in Section A1−4.1. Off-site disposal of tailings is discussed in Section A1−4.2. Active ground water remediation is proposed for both the on-site and off-site alternatives (Section A1−4.3.1). This BA places emphasis on ground water remediation due to contamination entering the Colorado River, which is designated critical habitat for four endangered fish species. The remediation goals (Section A1−4.3.2) are to reduce concentrations of five contaminants reaching the Colorado River to acceptable risk levels within 10 years of the ROD. Emphasis is placed on remediation of ammonia, which is the primary contaminant of concern. DOE implemented initial and interim actions (Section A1−4.3.3) in 2003 and 2004 in an attempt to begin reducing ammonia concentrations prior to full implementation of proposed ground water remediation.

DOE also analyzes the No Action alternative (Section 2.4 of the EIS), which serves as a baseline for comparing all alternatives, as required by NEPA regulation.

Although this BA assesses all of the alternatives included in the EIS to support final decision-making for remediation of the Moab mill tailings, the BO (Appendix A3) is limited in its scope to DOE's preferred alternatives of off-site disposal at Crescent Junction using mostly rail and active ground water remediation.